orativity or the potential rate of evaporation of a given part of the atmosphere is the rate of evaporation under the existing atmospheric conditions from a surface of water which is chemically pure and has the temperature of the atmosphere. It is expressed in depth of water (measured in liquid water) removed from the surface in a unit of time. Observations that give continuous records of evaporativity, some of them covering several years, are made at various localities by the U. S. Weather Bureau and by other agencies, by means of special apparatus and methods. The evaporation opportunity* afforded by a land surface or a surface of the hydrosphere in contact with the atmosphere is the ratio of the actual rate of evaporation from that surface to the evaporativity under existing atmospheric conditions. This ratio is generally stated as a percentage, and may be calculated by the formula

$$\textit{Relative evaporation} = 100\,\frac{e}{E}$$

where e is the actual rate of evaporation, in any convenient units, and E is the evaporativity in the same units. Generally, surfaces other than pure water surfaces have evaporation opportunities of less than 100 per cent, but under exceptional conditions of luxuriant vegetation the evaporation opportunity [relative evaporation] may be more than 100 per cent. The condition of any given part of the atmosphere with respect to its content of water vapor is known as the humidity.[1]

Solid and liquid water in the atmosphere may be derived mechanically from the hydrosphere, as through the action of wind in the cases of spray, drifting snow, etc., but it is largely derived through the process of condensation from the already existing atmospheric water vapor. Through the subsequent event of precipitation, atmospheric water becomes surface and subsurface water. Precipitation may be due to the falling of solid or liquid particles which have become too heavy to remain in suspension, or it may be due to the condensation, at the surface, of the earth of atmospheric water vapor, as in the cases of dew and frost. We thus have the following:

Classification of atmospheric water.

A. Water in gaseous state (Atmospheric water vapor); derived by evaporation.

B. Water in liquid or solid state:

1. Derived mechanically through the agency of wind: Spray, drifting snow, etc.
2. Derived by condensation:

a. In small particles * * *. 1. At some distance above the surface of the land or the hydrosphere: [Some cloud [S]. 2. At or near the surface of the land or the hydrosphere: Fog.

b. In larger particles * * *. Rain, snow, hail, sleet.—*E. W. W.*

*"Relative evaporation" would be, perhaps, more expressive of what this term means, and it would be more or less analogous to relative humidity. The fact that relative evaporation is already in use to express the relative losses from evaporation pans of different sizes exposed in the same atmospheric environment, should not necessarily preclude such a new application of this term. We do not speak of the 'relative rainfall' when comparing the catches of adjacent rain-gages, but refer to differences in catch. In the same way, the instrumental differences in the indications of adjacent evaporimeters should be referred to as differences in water loss, or, perhaps, to retain the present designation, *relative evaporation loss.—C. F. B.*

[1] A *space* is said to be saturated with water vapor, if the quantity of water vapor it contains is the maximum which it can hold at the existing temperature; in the absence of dust particles or other nuclei which promote condensation, a state of supersaturation may exist, however. It is to be emphasized that *the capacity of a given part of the atmosphere for water vapor is nearly the same as that of a like empty space, being modified only slightly by the presence of the other constituents of the air.* (Author's footnote.)

SOME EXAMPLES OF THE "COMPRESSION OF A CYCLONE."

By G. GUILBERT.

[Reprinted from Science Abstracts, Sect. A, Aug. 30, 1919, §998.]

The author gives concrete cases of the application of one of his general rules for weather forecasting which is as follows: Every depression which is surrounded on all sides by "convergent" winds of which the velocities are abnormal by excess, will fill up *in situ* within 24 hours—sometimes within 12 hours—with high pressure in the middle of the former depression.—*R. C.*

ON THE ERRORS WHICH CAN RESULT FROM AN INCOMPLETE KNOWLEDGE OF AEROLOGICAL CONDITIONS.

By L. DUNOYER.

[Reprinted from Science Abstracts, Sect. A, Sept. 30, 1919, §1158.]

On a long flight such as that across the Atlantic variations of wind may produce considerable deviations from the intended course unless they are correctly allowed for. To obtain numerical results two cases are considered: (1) That of a cross wind of constant direction the strength of which follows a sine-curve variation, the breadth of the current from one place of zero velocity to the next; or half period, being equal to the length of the flight; and (2) the case where the velocity remains constant but the direction of the wind varies uniformly along the course. For each of these cases the deviation, or lateral error, in making the point aimed at is calculated on the assumption that (*a*) no allowance is made for drift, and (*b*) that allowance is made throughout for a constant wind equal to that prevailing at the start. Taking a speed of flight of 150 km./hour and a maximum wind velocity of 25 m./sec. the deviation at the end of the course may attain to four-tenths of the length of the route if no correction for wind is made (case *a*) or to eight-tenths if the starting wind is corrected for throughout (case *b*). The errors may thus be very important.—*J. S. Di[nes]*.

ATMOSPHERIC CONDITIONS WHICH AFFECT HEALTH.

By L. HILL.

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The discomfort felt in crowded rooms is due to the low cooling and evaporating power of the air, not to its chemical impurities. To measure the cooling power from surfaces at body temperature the Kata-thermometer has been devised. The instrument is here described and the equations connecting its readings with the different meteorological elements (temperature, wind velocity, humidity, etc.) are set out. In an appendix the mean meteorological conditions are given for different stations and the cooling power is calculated. The cooling power in Madras in the shade and fully exposed to the wind during the worst months is found to be the same as that met with in shut-up rooms and factories in this country. Diagrams are given to prove how different the cooling power as shown by the Kata may be under different circumstances where ordinary thermometeric readings show little difference. The hope is expressed that cooling power at body temperature may be measured as part of the regular procedure at meteorological stations. It is also hoped that vapor pressure rather than, or in addition to, relative humidity may be recorded, as being of more service for determining the cooling of damp surfaces at body temperature.—*J. S. Di[nes]*.